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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/761,296	01/22/2004	Miki Onaka	1344.1130	3083

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EXAMINER

DIACOU, ARI M

ART UNIT	PAPER NUMBER
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3663

DATE MAILED: 07/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/761,296

Applicant(s)

ONAKA ET AL.

Examiner

Ari M. Diacou

Art Unit

3663

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 5-10-04.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 5-10-04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-4, 9, and 12-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Kosaka et al. (USP No. 5943162).

3. Regarding Claim 1, Kosaka discloses: An optical amplifier having a polarization mode dispersion compensation function comprising:

- a. a polarization control section that controls a polarization state of input signal light; [Fig 2, #3] [Col. 9, lines 5-12, 34-46]
- b. a polarization mode dispersion generation section that has an optical transmission medium which has birefringence capable of giving a differential group delay between orthogonal polarization mode components of the signal light controlled in said polarization control section, and which is doped with a rare earth element; [Fig 2, #4]
- c. a pumping light supply section that applies pumping light capable of pumping said rare earth element, to the optical transmission medium in said polarization mode dispersion generation section; [Fig 2, #6] [Col. 9, lines 12-15] [Col. 10, lines 64-67] [Col. 7, lines 11-16]

d. a monitoring section that monitors a polarization mode dispersion generation state of the signal light output from said polarization mode dispersion generation section; [Fig 2, #9] [Col. 9, lines 25-27]

e. and a control section that controls said polarization control section so that polarization mode dispersion monitored in said monitoring section is reduced. [Fig 2, #10] [Col. 9, lines 27-29, 52-56]

f.

4. Regarding Claim 3, Kosaka discloses: An optical amplifier having a polarization mode dispersion compensation function according to claim 1,

g. wherein said monitoring section monitors the power of signal light output from said polarization mode dispersion generation section, [Fig 2, #9] [Col. 9, lines 27-29]

h. and said control section controls said pumping light supply section so that the power of signal light monitored by said monitor section is fixed to be constant at a previously set value. [Fig 2, #10] [Col. 9, lines 27-29]

5. Regarding Claim 2, Kosaka discloses: An optical amplifier having a polarization mode dispersion compensation function according to claim 1,

i. wherein said monitoring section monitors the power of signal light output from said polarization mode dispersion generation section, [Fig 2, #9] [Col. 9, lines 27-29]

j. and said control section controls said pumping light supply section so as to obtain a gain which makes the power of signal light monitored by said monitor

section to be the power at the time of input or above.

[It is clear that the clause j. of this office action is a special case of clause h., and Kosaka's invention could perform this function.]

6. Regarding Claim 4, Kosaka discloses: An optical amplifier having a polarization mode dispersion compensation function according to claim 1,

k. wherein said monitoring section monitors the power of signal light output from said polarization mode dispersion generation section, and said control section controls said pumping light supply section so as to obtain a gain which makes the power of signal light monitored by said monitor section to be the power at the time of input or above. [Fig 5, #15] [Col 11, lines 21-24]

7. Regarding Claim 9, Kosaka discloses: An optical amplifier having a polarization mode dispersion compensation function according to claim 1, wherein said monitoring section comprises:

l. a branching device which branches a part of the signal light output from said polarization mode dispersion generation section, as monitor light; [Fig 2, #8] [Col. 9, lines 24-33]

m. an output monitor which monitors the power and polarization mode dispersion generation state of the monitor light branched by said branching device;

n. and a pumping light interception device having a property for transmitting the signal light and intercepting the pumping light, which prevents leaked light of

Art Unit: 3663

pumping light supplied to said polarization mode dispersion generating section from being input to said output monitor. [Fig 2, #5] [Col. 9, lines 12-24]

8. Regarding Claim 12, Kosaka discloses: An optical amplifier having a polarization mode dispersion compensation function according to claim 1,

o. wherein an optical filter having a property for transmitting the signal light and intercepting the pumping light and amplified spontaneous emission light generated accompanying amplification of the signal light in said polarization mode dispersion generation section, is provided on an optical path through which the signal light is propagated. [Col 5, lines 51-57]

9. Regarding Claim 13, Kosaka discloses: An optical amplifier having a polarization mode dispersion compensation function according to claim 1,

p. wherein when said polarization mode dispersion generation section is constructed by cascade connecting a plurality of optical transmission media having birefringence, a rare earth element is doped on at least the optical transmission media disposed on the signal light input side among said plurality of optical transmission media, [Fig 10]

q. and said pumping light supply section supplies forward pumping light to the optical transmission media doped with the rare earth element, of said polarization mode dispersion generation section. [Fig 2, #5] [Col. 9, lines 17-19]

10. Regarding Claim 14, Kosaka discloses: An optical amplifier having a polarization mode dispersion compensation function according to claim 1,

Art Unit: 3663

- r. wherein when said polarization mode dispersion generation section is constructed by cascade connecting a plurality of optical transmission media having birefringence, a rare earth element is doped on at least the optical transmission media disposed on the signal light output side among said plurality of optical transmission media, [Fig 10]
- s. and said pumping light supply section supplies backward pumping light to the optical transmission media doped with the rare earth element, of said polarization mode dispersion generation section. [Fig 2, #5] [Col. 9, lines 17-19]

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
11. Claims 5-8 and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kosaka as applied to claim 1 above, and further in view of Sanders et al. (USP No.

Art Unit: 3663

6301273). Kosaka discloses an optical amplifier with all the limitations of claim 1, but fails to teach the application of the optical amplifier to a planar lightwave circuit. Sanders teaches an optical amplifier with a polarization mode compensation function and discloses the use of an erbium-doped waveguide, made in a substrate of lithium niobate. Therefore, it would have been obvious to one skilled in the art (e.g. an optical engineer) at the time the invention was made, to create an optical amplifier with the limitations and structure disclosed by Kosaka, but in the form of a planar photonic integrated circuit, for the purpose of modularity and miniaturization and all of the documented obvious advantages thereof.

12. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kosaka et al. as applied to claim 9 above, and further in view of Hwang et al. (USP App. No. 10/854,347). Kosaka discloses an optical amplifier with all the limitations of claim 9, but fails to teach the functional equivalency of an isolator, a band-pass filter and a tap or a conventional optical fiber. Hwang teaches a wideband optical source composed of two fiber amplifiers with a plurality of connectors between them, including a mirror [Fig 2, #230], a filter [Fig 4, #432], an isolator [Fig 6, #630], and a coupler [Fig 3, #330]. Therefore, it would have been obvious to one skilled in the art (e.g. an optical engineer) at the time the invention was made, to substitute a filter [as in claim 10] or an isolator [as in claim 11] for an optically null component [as in claim 9]. As substitution is no more than the use of conventionally known optical amplifier filtering means available in the optics art.

Conclusion

13. The prior art which is cited but not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ari M. Diacou whose telephone number is (571) 272-5591. The examiner can normally be reached on Monday - Friday, 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on (571) 272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AMD 7-20-2005


JACK KEITH
PRIMARY EXAMINER
SPE 3663